



Part 95 Personal Radio Services Overview

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Part 95 - Personal Radio Services

- Subpart A – General Mobile Radio Service (GMRS)
- Subpart B - Family Radio Service (FRS)
- Subpart C - Radio Control (R/C) Radio Service
- Subpart D - Citizens Band (CB) Radio Service
- Subpart F - 218 - 219 MHz Service
- Subpart G - Low Power Radio Service (LPRS)
- Subpart H - Wireless Medical Telemetry Communications Service (WMTS)
- Subpart I - Medical Implant Communications Service (MICS)
- Subpart J - Multi-Use Radio Service (MURS)

This slide shows an overview of the Subparts of 47 CFR Part 95.

Part 95 is unique in that some of its Subparts don't require an station license. These Subparts which require equipment approval but not operator license are the family radio service, radio control service, citizens band service and multi-use radio service.

Background of Part 95 is that originally included devices which all required licenses. Over time some of the license requirements were dropped as the technology became more stable. Then some additional subparts were added which required equipment authorization but no licenses.



Part 95A- General Mobile (GMRS)

- Frequency Bands:
 - 462.55-462.725 MHz & 467.55-467.725 MHz
- General Technical Requirements
 - 95.621 - Frequency Tolerance
 - 95.631(a), (e), & (f) - Emission Types
 - 95.633 - Emission Bandwidth(s)
 - 95.635 - Unwanted radiation
 - 95.637 - Modulation Standards
 - 95.639 - Maximum Transmitter Power
 - 95.655 - Frequency Capability

This slide shows an overview of 47 CFR part 95 Subpart A General mobile radio service. An operators license is required to use this equipment. For GMRS Sections 95.29 and 95.621 show available channels.



Part 95B - Family Radio Service (FRS)

- Frequency Band:
 - 462.5625-467.7125 MHz
 - 14 Channels (7 of them shared with GMRS)
- General Technical Requirements
 - 95.193 - Types of Communication (voice/"tones")
 - 95.627(b) - Frequency Tolerance
 - 95.631 - Emission Types
 - 95.633 - Emission Bandwidth
 - 95.635 - Unwanted Radiation
 - 95.637 - Modulation Standards
 - 95.639 - Maximum Transmitter Power
 - 95.647 - Transmitter Antenna
 - 95.649 - Power Capability

This slide shows an overview of 47 CFR Part 95 Subpart B Family Radio Service. An operator license is not required for the operation of this equipment. For FRS units sections 95.627(a) shows available channels



Part 95B – FRS (Con't)

- Technical requirements
 - 95.193(b) One digital transmission every 30 second period
 - 95.194(d) Store & Forward packet data transmission prohibited
- Technical Specifications
 - Emission Designator F2D
 - Authorized Bandwidth 12.5 kHz
- Special Requirements:
 - Integral Antenna is required
 - See applicable Exclusion list
 - FRS radios can transmit GPS Data (FCC 03-26)
 - Allowed Transmissions: Send a radio location, Request a radio location, Send a text message

New rules for FRS per docket FCC 03-26 allowing GPS data transmission. Previously only voice transmission is allowed.

47 CFR Part 95 Subpart C is the Radio Control Radio Service. No operator license is required to use this type of equipment.

For the R/C service sections 95.207 and 95.623 address the available channels



Part 95B – FRS Combo Devices

- GMRS 95A permitted – requirements:
 - Different power out 5 watts vs 0.5 watts
 - Different Bandwidth 20/12.5 kHz vs 12.5 kHz
 - Different Licensing requirements – Licensed vs unlicensed
 - Must have integral antenna
- MURS 95J Not permitted per Section 95.665(d)
- Part 80 VHF 156-163 MHz permitted
- Part 80 UHF 456 – 468 MHz Not permitted per WTB
- Contact the FCC for current policy on combo devices

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The types of equipment that are permitted to be used in combination with FRS equipment is defined by the Wireless Technology Bureau therefore it is recommended checking with FCC Lab before issuing a grant for a combo device.

UHF 456-468 MHz combo not allowed because of complex issue related to the frequencies in question being shared between Part 80 and Part 90 and the potential for mis-use.

Due to the power differences between services the RF exposure requirements are different. Due to the potential different user groups, FRS are used by anyone, GMRS can be restricted to trained personnel which allows for higher exposure levels for GMRS

FRS radios must have integral antennas but GMRS don't have this requirement. A combo device FRS/GMRS must have an integral antenna.

Power output for these devices must be limited based on the mode of operation. When operating on FRS channels the maximum power must be 0.5 Watts ERP

Issues related to combining operations of this type are handled by the Wireless Telecommunication Bureau on a case by case basis. Currently FRS/GMRS and FRS/Part 80 VHF(156-163MHz) combos are permitted.



Part 95C - Radio Control Service (R/C)

- Frequency Bands:
 - 26.995 - 27.255 MHz
 - 72.01 - 72.99 MHz
 - 75.41 - 75.99 MHz
- General Technical Requirements:
 - 95.623 - Frequency Tolerance
 - 95.631 - Emission Types
 - 95.633 - Emission Bandwidth
 - 95.635 - Unwanted Radiation
 - 95.639 - Maximum Transmitter Power
 - 95.645 - Control Accessibility (Crystals)
 - 95.647 - Transmitter Antenna
 - 95.649 - Power Capability
 - 95.651 - Crystal Control Required



Part 95C – R/C Service (con't)

- Special Requirements:
 - Integral Antenna required
 - External crystal access prohibited
- Radio Control Service Crystals
 - Crystal Control – Per 95.645(b), plug in crystals may not be accessible by the end user
 - Crystal Access - Per 95.645(b), application must contain statement about accessibility of crystal
 - Use Grant Note RC



Part 95D - Citizens Band Radio Service (CB)

- Frequency Band:
 - 26.965 - 27.405 MHz
- General Technical Requirements:
 - 95.625(b) - Frequency Tolerance
 - 95.631 - Emission Types
 - 95.633 - Emission Bandwidth
 - 95.635 - Unwanted Radiation

47 CFR Part 95 Subpart D is the Citizens Band Radio Service. No operators license is required to use CB equipment.

For the CB service sections 95.407 and 95.625 address available channels. Additional information about 95.631 emission types is available in 95.412 and 95.413.



Part 95D – CB Radio Service (con't)

- General Technical Standards:
 - 95.637 - Modulation Standards
 - 95.639 - Maximum Transmitter Power
 - 95.649 - Power Capability
 - 95.655 - Frequency Capability
 - 95.667 - CB Transmitter Power
 - 95.669 - External Controls
 - 95.671 - Serial Number
- Special Requirements:
 - Final output stage has a 10 W power dissipation limit
 - Serial number must be engraved on TX Chassis

Power requirements are also addressed in 95.410 and 95.411.



Part 95F - 218-219 MHz Service

- Operating Frequency Bands:
 - 218.218.5 MHz and 218.501-219
- General Technical Requirements:
 - 95.853 - Frequency Segments
 - 95.855 - Transmitter ERP
 - 95.859 - Antennas
- Special Requirements
 - CTS & RTU Stations
 - CB External Controls – Per 95.669 device must comply with external controls requirements

47 CFR Part 95 Subpart F contains the 218-219 MHz band.

The 218-219 MHz band was formerly known as the Interactive Video and Data Service. Operation in this band requires a license.

This is an open band for any type of operation which meets the technical requirements.

For more information on this service see the Wireless Telecommunications Bureau rulemaking WT docket 98-169 on the Internet

RTU-Response Transmitter Unit

CTS-Cell Transmitter Station



Part 95G - Low Power Radio Service (LPRS)

- Frequency Bands:
 - 216 - 217 MHz
- General Technical Requirements:
 - 95.629 - Channel Bandwidths
 - 95.629 - Frequency Stability
 - 95.631 - Emission Types
 - 95.633 - Emission Bandwidth
 - 95.635 (c) - Unwanted Radiation
 - 95.639 - Maximum Transmitter Power

47 CFR Part 95 Subpart G contains the LPRS. An operator license is required to operate in this band.

Operating frequency information is addressed in 95.629

One type of device authorized in this band is hearing aid or auditory assistance devices.



Part 95G – LPRS (con't)

- Special Requirements:
 - 95.1009 - Permissible Communications
 - 95.1013 - Antennas
 - 95.1015 - Disclosure Policies
 - 95.1017 - Labeling Requirements
- Subpart H - Wireless Medical Telemetry Service (WMTS)
 - Operating Frequency Bands
 - 608 - 614 MHz
 - 1395 - 1400 MHz
 - 1429 - 1432 MHz



Part 95H - Wireless Medical Telemetry Service (WMTS)

- Frequency Bands
 - 608 - 614 MHz
 - 1395 - 1400 MHz
 - 1429 - 1432 MHz
- General Technical Requirements
 - 95.1115 - Technical Requirements
 - 95.1117 - Types of Communication
- Special Requirements
 - Voice & video Transmission prohibited.
 - RF Exposure evaluation is required for portable devices.

For addition information on the WMTS see ET Docket 99-255 which is a follow up of PR Docket 92-235. ET stands for Office of Engineering and Technology. PR was the Private Radio Bureau which is now part of the Wireless Bureau.



Part 95H – WMTS (Con't)

- Frequency Bands (Reference FCC 03-204)
608-614 MHz, 1395-1400 MHz, 1427-1431.5 MHz
- Upper Frequency Band Issues:
 - 95.639(g) and 95.1115 field strength limit section lists operating band as 1427-1429.5 MHz
 - 95.630 allowable frequency band section lists band as 1427 – 1432 MHz.
 - FCC 03-204 changes band to 1427 – 1431.5 MHz but doesn't correct 95.630 or address field strength limit for 1429.5 – 1431.5 MHz portion of band
- Policy
 - 1431.5 – 1432 MHz not authorizable
 - Field Strength limit across upper band 740 mV/m@3m

This history behind the confusion with the upper frequency band:

The original band was 1429-1432 MHz. A petition for reconsideration was filed due to some interference issue and the band for most of the US was changed to 1427-1429.5 MHz. An exception of this was allowed for certain areas where the frequencies are shared with Part 90 in specific areas of the country called "carve out" areas. These are listed in 90.259(b)(4). The chart on the next slide shows the band.

95.630 and the allowable field strength limits will be corrected in a future rulemaking.



Part 95I - Medical Implant Communications Service (MICS)

- Frequency Band: 402-405 MHz
- General Technical Requirements:
 - 95.628 - MICS Transmission must be externally initiated unless emergency situation
 - Listen before talk requirement
 - 95.631(l) - Emission Types
 - 95.633(f) - Emission Bandwidth
 - 95.635(d) - Unwanted Radiation
 - 95.639(g) - Maximum Transmitter Power
 - 95.649 - Power Capability
 - 95.651 - Crystal Control Required
- Tested in tissue equivalent liquid

MICS service for devices implanted in body.

95.628 contains requirements for Frequency monitoring for MICS transmitters.

For additional information see WT Docket 99-66

These devices are currently not eligible for TCB approval.



Part 95J - Multi-Use Radio Service (MURS)

- Permitted Frequencies:
 - 151.82, 151.88, 151.94, 154.57, & 154.6 MHz
- General Technical Standards:
 - 95.631 - Emission Types
 - 95.632 - Operating Frequency, bandwidth, and frequency stability.
 - 95.633 - Emission Bandwidth
 - 95.635 - Unwanted Radiation
 - 95.639 - Maximum Transmitter Power
 - 95.649 - Power Capability
 - 95.651 - Crystal Control required

The MURS service is a private, two way, short distance voice, data or image communications service for personal or business use.

Maximum Power for MURS equipment is 2 watts. Initially this power output was ERP but a recent rule making FCC02-139 changed this to a conducted limit and also prohibited the filing of combination FRS devices.

The frequencies in this service were formerly in Part 90 but moved to part 95 when the licensing requirement was eliminated.



Part 95K - Personal Locator Beacons (PLB)

- Rule Sections 95K (FCC 02-271)
 - 95.1400 Basis and Purpose
 - 95.1401 Frequency
 - 95.1402 406 MHz Special Requirements
 - RTCM Paper 76-2002/SC110-std dated June 19, 2002
 - Sections 95.1400 –For use for individuals participating in outdoor activities in remote areas
 - Example Application: KLS-PLB-1-GPS
- Must meet technical requirements specified for Part 80 PLBs (Reference Part 80 presentation)
- NOAA registration required



Further Information on Combo Devices Part 97 (Amateur Radio)

- Amateur (Part 97) combo transceivers are not permitted
- The one exception is that Part 97 (Amateur)/Part 87 (Aviation VHF 118-136.975 MHz) combo transceivers are permitted provided that marketing conditions are met]
- Part 97/87 Combo transceivers must be approved by the FAA Spectrum Engineering Division as specified in 47 CFR Section 87.147(d). The FAA approval letter must be included in the application as a letter exhibit. These devices must meet RF exposure requirements.

Grant Condition for Part 97/Part 87 VHF devices:

This device is for a combination amateur (Part 97) and Aviation (Part 87) device. The holder of this certificate will market this radio only to the aviation community including licensed pilots, aircraft owners, other Aeronautical Radio licensees, and other legitimate members of the aviation industry, and to vendors for such customers, through aeronautical marketing and distribution outlets such as websites, magazines and catalogues intended primarily for such audience.



Questions and Answers

Thanks!

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